

BBC DISK EXPLORER

Version 2.00

LAURIE WHIFFEN



Contents

1 Introduction 3

2 Using BBC Explorer 4

2.1	The Taskbar buttons	4
2.1.1	Exit	4
2.1.2	New (Create new disk image)	4
2.1.3	Open (Open disk image)	5
2.1.4	Extract (Extract files)	5
2.1.5	Delete (Delete files)	5
2.1.6	View (View BBC files from a floppy disk or disk image)	6
2.1.7	Compact (Compact a disk image)	6
2.1.8	Properties (Display the properties of a disk image)	6
2.1.9	Help	8
2.1.10	About	8
2.2	Adding files to a disk image	8
2.3	The Disk Image Pop-Up Menu	9

3 Disk Format Information 10

3.1	Introduction To The Two DFSs On The BBC	10
3.2	Physical Layout Of Data Between Formats	10
3.3	Single-sided Disk (SSD) Formats	10
3.4	Double-sided Disk (DSD) Formats	11

4 5.25" Floppy Support 12

4.1	Reading From An External 5.25" Drive	12
4.2	Problems With Support For Single Density	13

5 Improvements Over Version 1 14

1 Introduction

BBC Disk Explorer is a utility for the PC designed to help you extract, add or move standalone BBC program files between real BBC floppy disks, disk images and web sites that offer individual file downloads. It allows both standalone BBC files and disk images to be manipulated by the "drag-and-drop" method, in a similar manner to Windows Explorer.

This manual is to be used with Version 2.00 of BBC Disk Explorer.

Warning: The author takes no responsibility for any damage caused by using BBC Explorer. The software writes to the PC hard disk and so it is possible to damage files through its use. Although great care has been taken in testing the utility, the user must assume this risk.

Whereas earlier versions of BBC Explorer were limited to working only with disk images, note that this version includes the capability to read BBC floppies directly from your PC's floppy drive (if you have suitable hardware). This feature is *only* available to Windows 95 users however and does not work under Windows NT. For further information please see Chapter 4.

2 Using BBC Explorer

2.1 The Taskbar buttons

These are displayed in a bar over the top of the BBC Explorer window area. The taskbar contains buttons which perform various operations on floppies, disk images and files.



BBC Explorer has been designed to be as user friendly as possible. Files can be dragged and dropped from Windows Explorer (or any other "drag-and-drop" compliant program) onto an open disk image, as well as being dragged between images within the utility. More information on how to do this is found in Section 2.2 Adding Files To A Disk Image.

In addition to the taskbar buttons, certain other functions are performed through a pop-up menu. This appears when you click the right-hand mouse button over an icon in the left-hand pane. To view the contents of a floppy disk just click on the appropriate floppy disk icon in the left hand pane.

The taskbar buttons have the following effect on operations:

2.1.1 Exit

This button closes BBC Explorer. Your disk images are saved as you work on them so there is no need to save any disk images before you close the program.

2.1.2 New (Create new disk image)

Press this button to create a new disk image. The default image created will be in the Acorn DFS format. To change this you should use the Properties button and put a check mark in the Watford format box. To create a disk in a different format from the one selected (SSD), simply select one of the other file types in the "Create New Disk Image Box". The new disk image will be created according to the file extension that you have selected. Once you have created a new disk image you can add files to it.

It is also possible to change the PC filename of the disk image by clicking on the disk image name once it is highlighted, then typing in a new name and pressing ENTER.

Warning: If you change the file extension of the image file it will not change the image file format accordingly, i.e. if you change a .ssd file extension to a .dsd file extension, the file remains in single-sided disk format. BBC Disk Explorer will not be able to properly load and display a disk image with the wrong file extension so you should avoid doing this at all costs.

2.1.3 Open (Open disk image)

This button presents you with a "File Open Dialog Box", which allows you to select a disk image to open. Once you have created a new disk image you can add files to it.

Warning: If you try to open or manipulate a file that is not supported or has the incorrect file extension then you may corrupt that file.

2.1.4 Extract (Extract files)

To extract a file from a disk image:

1. Highlight the file(s) you want to extract
2. Press the extract button on the toolbar
3. A "Save File Dialog Box" will appear, allowing you to select the filename and location the extracted file will be saved under
4. Select a folder and drive in which to save the extracted file(s)
5. Edit the filename if you do not want to use the default filename
6. Finally click the "Save" button to save the BBC file to the selected destination drive

2.1.5 Delete (Delete files)

This button deletes all the files that are highlighted in the list of files in the right-hand pane.

2.1.6 View (View BBC files from a floppy disk or disk image)

This function allows you to view the contents of a file either on a BBC floppy disk or a disk image.

To view a file simply highlight it in the right-hand pane of BBC Disk Explorer and either click the View button or double click over the file. The file viewer window will pop up and you can cycle back and forth through the sectors of the file using the blue arrows.

When you have finished press the File Viewer's Exit button and the File viewer will close.

If you have more than one file selected and you press the file viewer button only the last file you selected will be displayed.

2.1.7 Compact (Compact a disk image)

When BBC disk images are copied from original disks, or disks generated by another disk imaging utility, it is possible for empty sectors to be left between files in the image. The compact button moves all the files in an image so as to remove these empty sectors, much like the *COMPACT command in the DFS. To compact a disk image, select the disk from the list on the left hand side and then press the compact button.

2.1.8 Properties (Display the properties of a disk image)

This button opens a properties box for the selected disk image. The following properties are shown:

BBC Disk name:

This is an 7 character string which identifies the disk. An edit box is provided so that you can change the disk name. This name is set to the first 7 characters of the PC filename when the image is created.

PC Filename:

This gives the folder and filename of the disk image file stored on the PC.

Disk writes:

This is field used by the DFS to register how many times a disk is written to. This is set to 0 for new disks and is not used by BBC Explorer.

Number of files:

This simply gives the number of files saved in this disk image.

Total sectors:

This determines how many sectors there are in the disk image. This is 800 for 80 track disks and 400 for 40 track disks. New disk images created by BBC Explorer are always 80 track.

Used Sectors:

This field gives the number of sectors occupied by the files on the disk. BBC Explorer always compacts files after an operation on a disk image, so this figure is usually the sum of all the files in sectors plus 2 (or 4 for Watford formatted disks) for the file list. If however the disk image has not been compacted there may be empty sectors between files which will make the disk image larger.

Attributes:

This set of radio buttons allows you to choose the boot options for the disk. These instruct the DFS on how it should deal with the !BOOT file on the disk. A new disk image is created by BBC Explorer with the None option. The Exec option executes the !Boot file, which should be a text file containing commands, usually to load and run a program. The Run option loads and executes the !Boot file which should contain 6502 assembler instructions. The Load instruction simply loads the !Boot file into memory.

Use Watford Format (62 files):

This check box is used to swap between Acorn DFS and Watford DFS disk formats.

When this box is checked and the Properties box is closed using the OK button the disk image will be changed to Watford format. It is then possible to save up to 62 files on the disk.

If this box is not checked, then when the Properties box is closed using the OK button the disk image will be changed to Acorn format. It is only possible to save up to 31 files on disk with this format.

Warning: If you swap back from Watford format to Acorn format and you have more than 31 files on the disk, all files after the 31st will be deleted.

If you press the any button except the OK button to close properties box then any changes you have made to the Disk image properties will be discarded.

2.1.9 Help

This button displays a help file, allowing you to browse through this instruction manual on screen.

2.1.10 About

This button displays the release information of the version of BBC Explorer which you are using. This manual complements Version 2.00 written by Laurie Whiffen.

2.2 Adding files to a disk image

There are two methods by which you can add files to a disk image:

From Windows Explorer:

1. Open Windows Explorer at the folder which contains the BBC files that you want to copy to a disk image.
2. Open BBC explorer, and open or create a disk image that you want to copy the files to.
3. Select the disk image in the left-hand pane of BBC Explorer so that its files are listed in the right-hand pane.
4. Use the ALT and TAB keys to switch to Windows Explorer.
5. Select the files you wish to copy with the left mouse button.
6. Hold down the left mouse button and "drag" the files into BBC Explorer. (You may need to use the ALT and TAB keys again to switch back to it.)
7. Drag the files to either the list of files (the right-hand pane) or over the disk image name in the left-hand pane.
8. When the cursor changes, you can drop the files and they will be copied to the disk image.

BBC Explorer expects files to be in the standard format, that is using an INF file to provide the necessary DFS file information. However, if no INF file exists then default values (of zero) will be assigned for the DFS load address and execution address and the default directory (\$) will be assumed. This means that any file (as long as it fits on to the disk) can be copied to a BBC disk image.

From Disk to Disk:

1. Open BBC Explorer.
2. Open the disk image(s) you want to copy files from.

3. Open or create the disk image(s) you want to copy files to.
4. Select the disk image that you want to copy a file from so that its files are listed in the right-hand pane.
5. Select the file(s) you want to copy with the left mouse button.
6. Hold down the left mouse button and "drag" the files over to the left-hand pane.
7. Drop them onto the name of the disk image you want to copy them to.

The files will be copied across. If there is not enough space or the file already exists on the destination disk image then you will be prompted.

Note that you can also copy files *from* (but not to) a BBC floppy disk if you have the appropriate hardware. See Chapter 4.

2.3 The Disk Image Pop-Up Menu

This pop-up provides an easy method to perform some disk image manipulation functions. The functions available from this menu, although they vary according to whether you select a disk image, a side or an actual disk, are:

New:

This performs the same function as the New button. It creates a new empty disk image.

Close:

This closes the currently highlighted disk image file.

Delete:

This will permanently delete the currently highlighted disk image file from your hard disk. You will be prompted before the deletion takes place.

Properties:

This will display the Properties box for the disk image that is highlighted.

3 Disk Format Information

3.1 Introduction To The Two DFSs On The BBC

The original BBC Acorn Disk Filing System (DFS) can store up to 31 files on a single side of a floppy disk and each disk can contain up to about 200K bytes of information. For average to large sized files, the limitation of the catalogue to 31 is not a problem. However, if your program requires a number of small files, it is possible to fill up the catalogue when in fact a lot of space remains on the disk.

Watford Electronics' own DFS addresses this problem by increasing the number of filenames that can be stored in a catalogue to 62.

3.2 Physical Layout Of Data Between Formats

Each disk is split into concentric rings called tracks which themselves are split into 10 sectors. The information that the DFS requires to load and save each file is stored in a list at the beginning of the disk, which occupy the first 2 sectors of the first track in the standard Acorn DFS.

The Watford DFS allocates the next 2 sectors (sectors 3 and 4 on the first track) to use for the extra 31 files. These 2 sectors contain the file information in the same format as the Acorn DFS, but are not read by the Acorn DFS. An Acorn DFS can only read the first 31 files of a disk using the Watford format, and if you try to write to a Watford formatted disk which contains more than 31 files you run a very high risk of losing those files that are in the Watford part of the file list.

You can use the Properties button to swap between Acorn DFS and Watford DFS formats, by putting or removing a check mark in the Watford format box at the bottom of the properties box.

Warning: If you swap back from Watford format to Acorn format and you have more than 31 files on the disk, all files after the 31st will be deleted.

3.3 Single-sided Disk (SSD) Formats

The BBC emulator community has used several different file formats for the disk images that they use. Despite having different file extensions, they are

all exactly the same: a simple sector by sector, track by track, dump of the disk. BBC Disk Explorer supports the following SSD disk image formats:

- SSD This is the default image type, by far the most commonly used.
- IMG This is used by the pcBBC emulator (by Stuart McConnachie/Ian Bell), and although it uses a different file extension it is exactly the same as SSD (pcBBC now supports the use of SSD and DSD) and it seems this image format has been superseded.
- BBC Again, exactly the same as SSD. You can create any of these disk image files by pressing the New button and selecting a filename with the extension you want.

3.4 Double-sided Disk (DSD) Formats

DSD format consists of two SSD images interleaved one track at a time. You can create a DSD image file by pressing the New button and selecting a filename with the DSD extension. If you want to change the Directory format between Acorn DFS and Watford DFS, then both sides of the image will be changed at the same time.

4 5.25" Floppy Support

4.1 Reading From An External 5.25" Drive

After many trials and tribulations, the ability to read directly from BBC floppy disks has been added to BBC Disk Explorer.

There are however a few points to watch for when reading from floppy directly:

1. BBC Disk Explorer will check your drives and see if you have any 5.25" floppy drives present on your system. If not then obviously you won't be able to read directly from floppies.
2. If you do have a suitable drive available, then it will be displayed as an icon in the drive list on the left-hand side. To display the contents of the disk simply insert the disk, and click once on the drive icon. You will then be able to drag files from the floppy across to disk images. If you do not refresh the directory each time you insert a disk then file copying operations will be based on the directory displayed in the right-hand window and not on the actual directory on the disk in the drive.
3. The software that interacts with the FDC is fairly rudimentary and stops BBC Disk Explorer completely while it is fetching data from the disk. It has no time out on the FDC operations and therefore if you have no disk in the drive, or the drive door is not shut properly, the drive light will come on and the BBC Disk Explorer will be frozen until a disk is inserted.
4. The floppy disk is read only. At the moment there is no write to disk.
5. The software automatically detects whether the floppy is 40 or 80 track, and with a 1.2MB floppy drive (80 track) will put it into double stepping mode to read 40 track disks. It will also automatically detect whether it is a single or double-sided disk.
6. It might be possible to have your BIOS setup so that the floppy drive has a different physical identifier to that reported by windows, i.e. your 5.25" drive is connected as a B: drive but windows reports it as A:. In this case, it is possible that BBC Disk Explorer may try to read a drive that is non-existent (i.e. Drive A: because windows reports that as a 5.25" drive) and it will then hang.

These features have been thoroughly tested on a Pentium Pro with an Intel motherboard and a single 1.2MB floppy drive. It is possible, and some would say probable, that people with different hardware may find that it doesn't work for them.

4.2 Problems With Support For Single Density

Single Density mode requires that the FDC uses a slower clock speed than is normally used in modern FDC chips. Some modern FDC's (like Intel on the Pentium Pro) are fortuitously able to work in SD mode. Others less fortunate will not; it depends on whether they can generate this slower clock, usually indicated by the presence of 2 clock crystals on the FDC board.

Some reports state that, given a couple of retries, some FDC's will manage it. However, if not then there is no more you can do, except search for an older FDC, or an FDC with an Intel chip on it. Even then there are no guarantees!

There is also the possibility that some floppy drives will not support SD mode. A TEAC 1.2MB drive, for example, will not initially work in SD mode as it has been configured so that reading Single Density is not possible. Although you could download the specification for the drive from TEAC's web site and, with technical knowledge, reconfigure the jumpers so that it does work, more and more drives out there may now not work in SD mode at all. If this is a problem, try buying an older second hand drive. They are generally quite cheap.

5 Improvements Over Version 1

Version 2 of BBC Disk Explorer has been improved in several ways:

1. Support for double-sided disks has been added. This allows the creation of disk images with two interleaved single-sided disk images, using the same format as Wouter Scholten's utility BBCIM.EXE. These images can be either Acorn DFS format (31 files per side) or Watford DFS format (62 files per side).
2. Support for reading BBC format 5.25" floppies directly from your disk drive, similarly to Wouter Scholten's FDC.COM. However, note that some Floppy Disk Controllers have broken support for Single Density (SD) mode.
3. A BBC File Viewer has been added, so that you can browse through files on a disk.
4. File selection has been improved so that the same system is used as in Windows Explorer (by using the SHIFT and CTRL keys).

If you have further suggestions, or information about bugs then please e-mail: strawb@idiom.com

If reporting bugs, please include as much information as possible. Ensure you explain what hardware you are using if it is a floppy related problem.